WHAT IS CLAIMED IS:

SUB A'

1. A programmable intra-packet switching method comprising:

polling, in a systematic fashion, a plurality of data ports connected to a network to determine which port, if any, contains a data packet available for processing; and

fragmenting the available data packet into at least one data cell having a defined size; wherein this fragmentation continues until a user-defined number of cells are generated.

2. The programmable intra-packet switching method of claim 1 further comprising:

monitoring the number of data cells produced to determine if the user defined number of cells have been generated.

3. The programmable intra-packet switching method of claim 2 wherein monitoring the number of data cells produced includes:

initiating the polling process, if it is determined that the user defined number of cells have been generated, to determine if any other port contains a data packet available for processing.

4. The programmable intra-packet switching method of claim 3 wherein monitoring the number of data cells produced includes:

storing at least one data element concerning the data packet currently being processed if it is determined

that another port contains a data packet available for processing, wherein this data element allows for subsequent processing of the remainder of the data packet currently being processed.

5. The programmable intra-packet switching method of claim 4 wherein monitoring the number of data cells produced includes:

initiating the fragmentation process, if it is determined that another port contains a data packet for processing, to fragment the data packet on the other port into at least one data cell having a defined size;

wherein the packet fragmentation process continues fragmenting the data packet on the other port into data cells until the user-defined number of cells are generated.

6. The programmable intra-packet switching method of claim 1 further comprising:

determining if the data packet has been fully fragmented into at least one data cell.

7. The programmable intra-packet switching method of claim 6 wherein determining if the data packet has been fully fragmented includes:

initiating the polling process, if it is determined that the data packet has been fully fragmented into at least one data cell, to determine if any other port contains a data packet available for processing.

8. The programmable intra-packet switching method of claim 7 wherein determining if the data packet has been fully fragmented includes:

initiating the fragmentation process, if it is determined that another port contains a data packet for processing, to fragment the data packet on the other port into at least one data cell having a defined size;

wherein the packet fragmentation process continues fragmenting the data packet on the other port into data cells until the user-defined number of cells are generated.

9. A programmable intra-packet switching process comprising:

a port polling process for polling, in a systematic fashion, a plurality of data ports connected to a network to determine which port, if any, contains a data packet available for processing; and

a packet fragmentation process, responsive to said port polling process determining that one of said ports contains a data packet, for fragmenting said data packet into at least one data cell having a defined size;

wherein said packet fragmentation process continues fragmenting said data packet into said data cells until a user-defined number of cells are generated.

10. The programmable intra-packet switching process of claim 9 further comprising:

a cell limit monitoring process for monitoring the number of data cells produced by said packet fragmentation process to determine if said user defined number of cells have been generated.

11. The programmable intra-packet switching process of claim 10 wherein said cell limit monitoring process includes:

a cell limit port switching process, responsive to said cell limit monitoring process determining that said user defined number of cells have been generated, for

initiating said polling process to determine if any other port contains a data packet available for processing.

12. The programmable intra-packet switching process of claim 11 wherein said cell limit monitoring process includes:

a packet information storage process, responsive to said cell limit port switching process determining that another port contains a data packet available for processing, for storing at least one data element concerning the data packet currently being processed, wherein said data element allows for subsequent processing of the remainder of the data packet currently being processed.

13. The programmable intra-packet switching process of claim 12 wherein said at least one data element includes:

a data packet remainder length indicator, indicative of the length of the portion of said data packet not fragmented; and

a packet truncation indicator, indicative of the incomplete fragmentation status of said data packet.

14. The programmable intra-packet switching process of claim 11 wherein said cell limit monitoring process includes:

a cell limit fragmentation switching process, responsive to said cell limit port switching process determining that another port contains a data packet for processing, for initiating said packet fragmentation

process to fragment said data packet on said other port into at least one data cell having a defined size;

wherein said packet fragmentation process continues fragmenting said data packet on said other port into said data cells until said user-defined number of cells are generated.

15. The programmable intra-packet switching process of claim 9 further comprising:

a packet completion monitoring process for monitoring the status of said packet fragmentation process to determine if said data packet has been fully fragmented into said at least one data cell.

16. The programmable intra-packet switching process of claim 15 wherein said packet completion monitoring process includes:

a packet completion port switching process, responsive to said packet completion monitoring process determining that said data packet has been fully fragmented into said at least one data cell, for initiating said polling process to determine if any other port contains a data packet available for processing.

17. The programmable intra-packet switching process of claim 16 wherein said packet completion monitoring process includes:

a packet completion fragmentation switching process, responsive to said packet completion port switching process determining that another port contains a data

packet for processing, for initiating said packet fragmentation process to fragment said data packet on said other port into at least one data cell having a defined size; wherein said packet fragmentation process continues fragmenting said data packet on said other port into said data cells until said user-defined number of cells are generated.

18. The programmable intra-packet switching process of claim 9 further comprising:

a user interface for allowing a user to specify at least one user-defined parameter utilized by said packet fragmentation process.

19. The programmable intra-packet switching process of claim 18 wherein said at least one user-defined parameter includes:

said user-defined number of cells to be generated by said packet fragmentation process; and

said defined size of said at least one data cell.

20. The programmable intra-packet switching process of claim 9 wherein said at least one data cell having a defined size is a 53-byte Asynchronous Transfer Mode (ATM) cell.

21. A programmable packet fragmentation process comprising:

a port polling process for polling a plurality of data ports connected to a synchronous optical network to determine the availability of a data packet on any of said ports;

a packet fragmentation process, responsive to said port polling process determining the availability of said data packet on one of said plurality of ports, for fragmenting said data packet into at least one Asynchronous Transfer Mode (ATM) cell.

22. The programmable intra-packet switching process of claim 21 further comprising:

a cell limit monitoring process for monitoring the number of data cells produced by said packet fragmentation process to determine if said user defined number of cells have been generated.

23. The programmable intra-packet switching process of claim 21 further comprising:

a packet completion monitoring process for monitoring the status of said packet fragmentation process to determine if said data packet has been fully fragmented into said at least one data cell.

24. A programmable intra-packet switching process comprising:

a port polling process for polling a plurality of data ports connected to a network to determine which port, if any, contains a data packet available for processing; and

a packet fragmentation process, responsive to said port polling process determining that one of said ports contains a data packet, for fragmenting said data packet into at least one data cell; wherein said packet fragmentation process continues fragmenting said data packet into said data cells until a port-switching event occurs.

25. The programmable intra-packet switching process of claim 24 wherein said port-switching event is an unbalanced port-loading condition.

26. The programmable intra-packet switching process of claim 24 wherein said port-switching event is the generation of a user-defined number of cells.

27. The programmable intra-packet switching process of claim 26 further comprising:

a cell limit monitoring process for monitoring the number of data cells produced by said packet fragmentation process to determine if said user defined number of cells have been generated.

28. The programmable intra-packet switching process of claim 24 further comprising:

a packet completion monitoring process for monitoring the status of said packet fragmentation process to determine if said data packet has been fully fragmented into said at least one data cell.

29. A computer program product residing on a computer readable medium having a plurality of instructions stored thereon which, when executed by the processor, cause that processor to:

poll, in a systematic fashion, a plurality of data ports connected to a network to determine which port, if any, contains a data packet available for processing; and

fragment the available data packet into at least one data cell having a defined size; wherein this fragmentation continues until a user-defined number of cells are generated.

30. The computer program product of claim 29 wherein said computer readable medium is a read-only memory.

31. The computer program product of claim 29 wherein said computer readable medium is a random access memory.

32. A processor and memory configured to:

poll, in a systematic fashion, a plurality of data ports connected to a network to determine which port, if any, contains a data packet available for processing; and

fragment the available data packet into at least one data cell having a defined size; wherein this fragmentation continues until a user-defined number of cells are generated.

33. The processor and memory of claim 32 wherein said processor and memory are incorporated into a single board computer.

34. The processor and memory of claim 32 wherein said processor and memory are incorporated into an Asynchronous Transfer Mode / Packet Over Sonet (ATM/POS) processor.